

Hall Ticket Number:

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Code No. : 15601

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (IT) III Year I-Semester Old Examinations, May-2019

Database Management Systems

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. What is logical data independence and why is it important?
2. Define the concept of aggregation in ER-model with an example.
3. What is a relation schema key? List the properties of a relation schema key.
4. List the aggregate functions in SQL.
5. What is functional dependency discuss with an example?
6. List the constraints to be satisfied to achieve referential integrity constraint.
7. What is the need of dynamic hashing?
8. State the properties of Transaction.
9. Discuss the purpose of Thomas write rule.
10. Differentiate between system recovery and media recovery.

Part-B (5 × 10 = 50 Marks)

11. a) Compare and contrast object-based logical models and Record-based logical models. [5]
b) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents using the following schema. [5]
Car (reg_no, colour, cost)
Insurance (cust_id, reg_no, dateof_reg, accident_status)
Customer (cust_id, name, age, address)
12. a) Explain any two of the following operations in Relational algebra with given data below: [6]
i) Natural Join ii) Division iii) Cross Product

Sailors

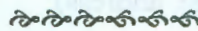
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| 101 | Dustin | 10 |
| 102 | Lubber | 5 |
| 103 | Horatio | 6 |
| 104 | Ronald | 10 |

Reserves

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| 103 | 22 | 1999 |
| 104 | 33 | 2000 |
| 101 | 22 | 2001 |
| 102 | 34 | 1999 |

- b) Given the following relations: [4]
Vehicle (reg_no, colour)
Person (eno, name, address)
Owner (eno, reg_no)
Write a query to list the names of the persons who do not own any car.

13. a) Write short notes on Embedded SQL. [4]
 b) Consider the relation R (A, B, C, D, E) with the set of function dependencies $F = \{AB \rightarrow C, D \rightarrow E, A \rightarrow D\}$ [6]
 i) Find out whether R is in 3NF or BCNF. Justify.
 ii) Consider the decomposition of R into R1 (A, B, C) and R2 (A, D, E). Is the decomposition lossless and dependency preserving? Justify.
14. a) Discuss how multi-level indexes are constructed using B⁺ trees and B trees. [7]
 b) Describe the problem of phantom phenomenon. Explain. [3]
15. a) Explain 2PL protocol and state why strictly 2PL and rigorous 2PL are more efficient than that of 2PL. [6]
 b) Differentiate deferred and immediate-modification version of the log-based recovery scheme. [4]
16. a) Explain the difference between external, internal, and conceptual schemas. [5]
 b) Consider the following schema: [5]
 Suppliers(sid, sname, address)
 Parts(pid, pname, color)
 Catalog(sid, pid, cost)
 Write a SQL query to find pairs of sids such that the supplier with the first sid charges more for some part than the supplier with the second sid.
17. Answer any *two* of the following:
 a) Discuss in-detail about the role of transitive dependency in 3NF. [5]
 b) Explain why local depth and global depth are needed in extendible hashing. [5]
 c) Illustrate the principles of deadlock avoidance and recovery in database transactions. [5]



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| 1995 | 20 | 101 |
| 1996 | 22 | 102 |
| 1997 | 25 | 103 |
| 1998 | 28 | 104 |

| Rating | Part | Supplier |
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| 10 | 101 | Supplier A |
| 5 | 102 | Supplier B |
| 8 | 103 | Supplier C |
| 10 | 104 | Supplier D |